

REMARKS

In view of the above amendment, Applicants believe the pending application is in condition for allowance.

Claims 2, 4-19, 21, and 23 are now present in this application, of which claims 2, 4, 21, and 23 are independent. By this amendment, claims 1, 3, 20, and 22 have been canceled, and claims 2, 4-8, 10, 13-19, 21, and 23 have been amended. Reconsideration of this application, as amended, is respectfully requested.

Priority Under 35 U.S.C. § 119

Applicants thank the Examiner for acknowledging Applicants' claim for foreign priority under 35 U.S.C. § 119, and receipt of the certified priority document.

Information Disclosure Citation

Applicants thank the Examiner for considering the references supplied with the Information Disclosure Statement filed November 29, 2005, and for providing Applicants with an initialed copy of the PTO-SB08 form filed therewith.

Drawings

The Office Action indicates that the drawings are accepted by the Examiner. No further action is necessary at this time.

Rejections Under 35 U.S.C. §§ 102 and 103

Claims 1, 5, and 20 stand rejected under 35 U.S.C. § 102(b) as being anticipated by Reynolds; claims 2, 3, and 21-22 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Reynolds in view of Farnworth; claim 6 stands rejected under 35 U.S.C. § 103(a) as being unpatentable over Reynolds in view of Gilmore; claim 19 stands rejected under 35 U.S.C. § 103(a) as being unpatentable over Reynolds in view of Roy; claims 7, 8, 10-12, and 14-16 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Reynolds in view of Ham; and claim 9 stands

rejected under 35 U.S.C. § 103(a) as being unpatentable over Reynolds in view of Ham and further in view of Neo. This rejection is respectfully traversed.

Complete discussions of the Examiner's rejections are set forth in the Office Action, and are not being repeated here.

While not conceding the appropriateness of the Examiner's rejection, but merely to advance prosecution of the instant application, Applicants respectfully submit that claims 1, 3, 20 and 22 have been canceled, without prejudice or disclaimer, thus rendering portions of these rejections under 35 U.S.C. §§ 102 and 103 moot.

While not conceding the appropriateness of the Examiner's rejection, but merely to advance prosecution of the instant application, Applicants respectfully submit that independent claim 2 has been amended to recite a combination of elements in an electronic device test apparatus for testing DUTs by pushing their input/output terminals against contact units of a test head including "a moving device configured to pick up and move the DUTs", "a first imaging device configured to capture an image of a front surface of the DUT on which the input/output terminals are led out before being picked up by the moving device", "a second imaging device configured to capture an image of a back surface of the DUT on which the input/output terminals are not led out after being picked up by the moving device", and "a calculating device configured to calculate the position and posture of the outside shape of the front surface of the DUT before being picked up by the moving device and the position and posture of the input/output terminals of the DUT before being picked up by the moving device from image information captured by the first imaging device, calculate the position and posture of the outside shape of the back surface of the DUT after being picked up by the moving device from image information captured by the second imaging device, and calculate the position and posture of the input/output terminals of the DUT after being picked up by the moving device based on the results of these calculations."

Similarly, while not conceding the appropriateness of the Examiner's rejection, but merely to advance prosecution of the instant application, Applicants respectfully submit that independent claim 21 has been amended to recite a combination of steps in a method of testing DUTs pushing their input/output terminals against contact units of a test head including

“capturing a first image of a front surface of a DUT on which the input/output terminals are led out before the DUT is picked up by a moving device configured to pick up and move DUTs”, “capturing a second image of a back surface of a DUT on which the input/output terminals are not led out after being picked up by the moving device”, and “calculating the position and posture of the outside shape of the front surface of the DUT before being picked up by the moving device and the position and posture of the input/output terminals of the DUT before being picked up by the moving device from the first image”, calculating the position and posture of the outside shape of the back surface of the DUT after being picked up by the moving device from the second image”, and “calculating the position and posture of the input/output terminals of the DUT after being picked up by the moving device based on the results of these calculations.”

Applicants respectfully submit that the combinations of elements or steps as set forth in independent claims 2 and 21 are not disclosed or made obvious by the prior art of record, including Reynolds and Farnworth.

Applicants respectfully submit that the present invention, as set forth independent claims 1 and 5, arranged so that (i) the first imaging device captures an image of a front surface of the DUT on which the input/output terminals are led out before being picked up by the moving device, (ii) the second imaging device captures an image of a back surface of the DUT on which the input/output terminals are not led out after being picked up by the moving means, (iii) the calculating device calculates (a) the position and posture of the outside shape of the front surface in the DUT before being picked up by the moving device and (b) the position and posture of the input/output terminals of the DUT before being picked up by the moving means from image information captured by the first imaging device, (iv) the calculating device calculates the position and posture of the outside shape of the back surface of the DUT after being picked up the moving device from image information captured by the second imaging device, and (v) the calculating device calculates the position and posture of the input/output terminals of the DUT after being picked up by the moving device based on the results of these calculations.

Under conventional approaches, because of the arrangement of a moving device and an imaging device, when the moving device picks up the front surface (on which the input/output

terminals are led out) of a DUT, the imaging device cannot capture the front surface because the moving device hides the front surface from the view of the imaging device. As a result, it is difficult to determine the position and posture of the input/output terminals on the front surface.

In contrast, as a result of the present invention, even if the moving device hides the front surface, it is possible to determine the position and posture of the hidden input/output terminals of the DUT and achieve high precision positioning of the DUT.

On the other hand, in Farnworth, the primary gripper 52 aligns the die 202 and the temporary package base 302 and press them together, thereby creating a completed assembly with the package lid and restraining device (col. 14, lines 24-27). The bond pads 204 of the die 202 picked up by the primary gripper 52 are directed downward and the primary gripper (52) picks up the back surface (on which the input/output terminals 204 are not led out) of the DUT, because the bond pads 204 of the bare die 202 and the contact 314 of the package base 302 mounted on the insert 316 contact (col. 16, lines 49-51 and col. 17, lines 5-8), as shown Fig. 15. Also, the fine die camera 30 captures the die 202 from downside in arrangement similar to that of rough die camera 24 (col. 11, lines 24-27 and Fig. 4). Therefore, the fine die camera 30 captures the front surface (on which the input/output terminals 204 led out) of the die 202 and do not capture the back surface of the die.

For these reasons, Farnworth does not disclose the above-mentioned element (ii) and (v) of the amended present invention. In other words, because Farnworth does not have the second image camera arranged as claimed, it would not have been obvious to modify Reynolds in view of Farnworth to teach the calculating device/calculating steps. Furthermore, Farnworth does not require the above-mentioned element (v) because the fine camera 30 can directly capture the input/output terminals 204 of the die 202. As such, one ordinary skill in the art would look to Farnworth to modify Reynolds as proposed by the Examiner. Accordingly, reconsideration and withdrawal of the § 103 rejection of claims 2 and 21 are respectfully requested.

With regard to dependent claims 5-12, 14-16, and 19, Applicants submit that claims 5-12, 14-16, and 19 depend, either directly or indirectly, from independent claim 2, which is allowable for the reasons set forth above, and therefore claims 5-12, 14-16, and 19 are allowable based on their

dependence from claim 2, as well as for their additionally recited subject matter. Reconsideration and allowance thereof are respectfully requested.

Allowable Subject Matter

The Examiner states that claims 4, 13, 17, 18, and 23 would be allowable if rewritten in independent form.

Applicants thank the Examiner for the early indication of allowable subject matter in this application. However, claims 13, 17, and 18 have not been rewritten in independent form at this time, since it is believed that independent claim 2 from which these claims depend is allowable.

Objected-to claims 4 and 23 have been rewritten into independent form. Each of the independent claims 4 and 23 include additional modifications to the claim terminology. Applicants respectfully submit that these claims are allowable over the cited art.

Additional Cited References

Since the remaining references cited by the Examiner have not been utilized to reject the claims, but have merely been cited to show the state of the art, no comment need be made with respect thereto.

CONCLUSION

All of the stated grounds of rejection have been properly traversed, accommodated, or rendered moot. Applicants therefore respectfully request that the Examiner reconsider all presently outstanding rejections and that they be withdrawn. It is believed that a full and complete response has been made to the outstanding Office Action, and as such, the present application is in condition for allowance.

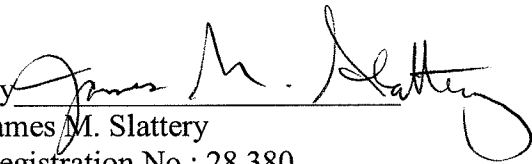
If the Examiner believes, for any reason, that personal communication will expedite prosecution of this application, the Examiner is invited to telephone Chad D. Wells, Registration No. 50,875, at (703) 205-8000, in the Washington, D.C. area.

Prompt and favorable consideration of this Amendment is respectfully requested.

If necessary, the Commissioner is hereby authorized in this, concurrent, and future replies, to charge payment or credit any overpayment to Deposit Account No. 02-2448 for any additional fees required under 37 C.F.R. §§ 1.16 or 1.17; particularly, extension of time fees.

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Respectfully submitted,

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